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Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-36. (Canceled)

37. (original) A vaccine preparation comprising at least one antigen and a molecule selected from the group consisting of

(a) a human β_2-microglobulin molecule having a valine at position 55; and

(b) a fusion protein comprising a first amino acid sequence and a second amino acid sequence, wherein the second amino acid sequence is a β_2-microglobulin.

38. (original) A vaccine preparation according to claim 37(b) wherein the β_2-microglobulin is hβ_2m S55V.

39. (original) A vaccine preparation according to claim 37 wherein the antigen is selected from the group consisting of bacterial, viral and tumor antigens.

40. (original) A method of vaccinating a mammal, comprising administering to the mammal a vaccine preparation according to claim 37.

41. (original) A method of vaccinating a mammal, comprising administering to the mammal an antigen and a microglobulin protein selected from the group consisting of:

(a) a human β_2-microglobulin protein having a valine at position 55; and

(b) a fusion protein comprising a first amino acid sequence and a second amino acid sequence, wherein the second amino acid sequence is a β_2-microglobulin.

42. (currently amended) A method of stimulating a tumor-reactive cytotoxic T-cell response, comprising:

(a) isolating T-cells from a patient having a tumor;

(b) isolating tumor cells from the patient;

(c) incubating the tumor cells with a fusion protein ~~according to claim 4~~ comprising a first amino acid sequence and a second amino acid sequence, wherein the second amino acid sequence is a β_2-microglobulin (β_2m), ~~such that~~ wherein the β_2m induces presentation of the fusion protein ~~is presented~~ on the surface of the tumor cells;

(d) incubating the T-cells in the presence of the fusion protein-presenting tumor cells to increase the number of tumor-reactive T-cells; and

(e) administering a therapeutically effective dose of the tumor-reactive T-cells to the patient.

43. (new) The method of claim 42, wherein the β_2m sequence is a wild-type β_2m sequence.

44. (new) The method of claim 42, wherein the β_2m sequence is a modified β_2m sequence that retains the ability to bind to an alpha chain of a class 1 MHC molecule.

45. (new) The fusion protein of claim 44, wherein the modified β_2m sequence is a human β_2-microglobulin (hβ_2m) S55V sequence.

46. (new) A fusion protein comprising a first amino acid sequence and a second amino acid sequence, wherein the first amino acid sequence is a cytokine, cell adhesion molecule, or CD40, and wherein the second amino acid sequence is a β_2m.

47. (new) The fusion protein of claim 46, wherein the β_2m sequence is a wild-type β_2m sequence.

48. (new) The fusion protein of claim 46, wherein the β_2m sequence is a modified β_2m that retains the ability to bind to class 1 MHC molecules.

49. (new) The fusion protein of claim 48, wherein the modified β_2m sequence is a human β_2-microglobulin (hβ_2m) S55V sequence.

50. (new) The fusion protein of claim 46, wherein the cytokine is interleukin-2 (IL-2), interleukin-12 (IL-12), granulocyte-macrophage colony-stimulating factor (GM-CSF), or tumor necrosis factor (TNF)-alpha.

51. (new) The fusion protein of claim 46, wherein the cell adhesion molecule is VCAM-1.

52. (new) The fusion protein of claim 46, wherein the first amino acid sequence is joined to the second amino acid sequence.

53. (new) The fusion protein of claim 52, wherein the first amino acid sequence is joined to an amino terminus of the second amino acid sequence.

54. (new) The fusion protein of claim 52, wherein the first and second sequences are linked by a peptide linker.

55. (new) The fusion protein of claim 46, wherein the fusion protein further comprises a signal peptide joined to an amino terminus of the first amino acid sequence.

56. (new) The fusion protein of claim 55, wherein the signal peptide is a β_2m signal peptide.

57. (new) A recombinant nucleic acid molecule encoding the protein of claim 46.

58. (new) A vector comprising the recombinant nucleic acid molecule of claim 57.

59. (new) A transgenic cell comprising the recombinant nucleic acid molecule of claim 57.

60. (new) A cell having a cell membrane comprising the fusion protein of claim 46.

61. (new) A method of enhancing the immune response of a mammal to an antigen presented on the surface of a cell, the method comprising:

contacting the cell with the fusion protein of claim 46 such that the fusion protein is presented on the surface of the cell; and

administering the cell to a mammal.

62. (new) The method of claim 61, wherein the cell is a tumor cell.

63. (new) A method of enhancing the immune response of a mammal to an antigen presented on the surface of a cell, the method comprising:

transforming the cell with the recombinant nucleic acid molecule of claim 57, such that expression of the nucleic acid molecule results in expression of a fusion protein encoded by the nucleic acid molecule being presented on the surface of the cell; and

administering the cell to a mammal.

64. (new) The method of claim 63, wherein the cell is a tumor cell.